

# ISFS Sensors and Capabilities



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## Integrated Surface Flux System

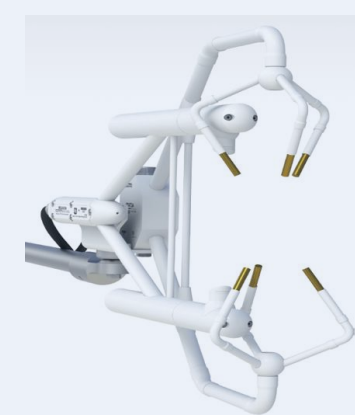
Integrated Surface Flux System (ISFS) is part of The National Center for Atmospheric Research Earth Observing Lab (NCAR / EOL). Our mission is to make atmospheric observations to support National Science Foundation-funded research projects. We deploy suites of ground- and tower-mounted instruments in support of university researchers studying a wide variety of topics in locations all around the world.

ISFS combines the capabilities of a network of surface weather stations with the ability to support intensive micrometeorological research at a single or multiple sites. Investigators can configure ISFS resources to match the research objectives of each field project.

Multiple sites (presently 30) can be instrumented to measure near-surface wind, temperature, humidity, pressure, and precipitation in the network mode. As needed, scientists can also request measurements of momentum fluxes, sensible and latent heat fluxes, short-wave and long-wave radiation, soil temperature, soil moisture, and soil heat flux at each station.

## ISFS Sensors

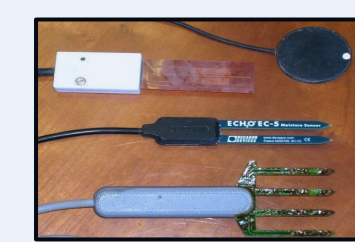
Fluxes/Turbulence:  
3-Component Sonic Anemometer with Infrared CO<sub>2</sub>/H<sub>2</sub>O Gas Analyzer



Meteorology/Turbulence:  
Absolute Nanobarometer



Fluxes/Hydrology:  
Soil Thermal Properties and Moisture



+ User sensors:  
We can intergrate custom user sensors



Radiative Forcing:  
4-Component Integrated Radiometer  
Also: 1- Component Long & Short wave Radiometers



Meteorology:  
2-Component Sonic Anemometer (with heating)



Meteorology:  
Temperature/Humidity



All-Season Precipitation:  
Optical Distrometer

## ISFS Towers

The instruments can be mounted on a variety of towers at multiple heights in multiple locations to collect the desired measurements.

### Rohn towers



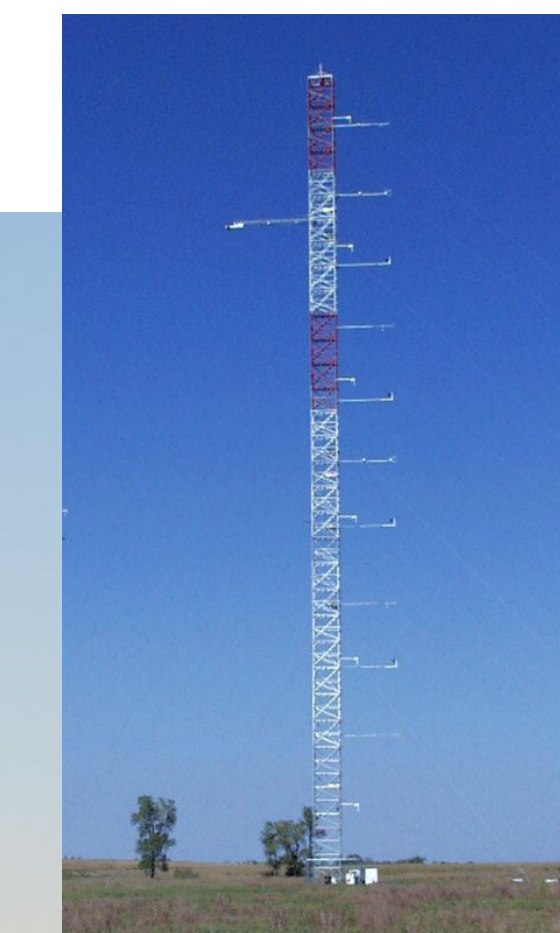
### PAM tower (SEB)



### Trailer tower (32m)



### Scaffolding tower



## Data and Power

- Data are recorded and stored on our Linux based data acquisition systems running NIDAS. Data can be recorded at sampling frequencies up to 60 Hz.
- Stations can be powered with ISFS solar panels with backup batteries or AC line power where available.
- Data products are quality controlled after post calibration of sensors, and final data products are provided within 6 months of the completion of the field project.



## Base Trailer

The ISFS Base trailer can be deployed with field projects to provide office space, and mechanical/electronic work space.



## Major types of measurements

- Basic meteorology
- Surface energy balance
  - 4-component radiation
  - Sensible/Latent heat flux
  - Soil heating/moisture
- Dry deposition (CO<sub>2</sub>, O<sub>3</sub>, aerosols, water!, snow!)
- Flux-gradient relations ( $u_*$ ,  $T_*$ ,  $q_*$ )
- Turbulent Kinetic Energy (TKE) budget
- Through-canopy turbulence
- Radiative flux divergence (clear-air nocturnal, fog)

## Flux Tower Deployments

